

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listing of claims in the application.

Listing of Claims:

1-19 (Canceled)

20. (Currently Amended) A personal identification apparatus comprising:
two light sources to irradiate light to a finger from two sides of the finger;
a single image capture unit to capture the light from the light sources transmitted through the finger; and

a processing unit to cause the two light sources to irradiate the light alternately, and cause ~~the said single~~ image capture unit to capture a plurality of images at a timing of the irradiation of the light sources,

wherein the processing unit extracts a feature of a vein pattern of the finger from the plurality of images ~~generated using captured by said single image capture unit due to said light irradiated by said two light sources and captured by the single image capture unit~~ and executes personal identification using the extracted feature.

21. (Previously Presented) The personal identification apparatus according to claim 20, wherein:

the processing unit extracts the feature of the vein pattern from unsaturated regions of the plurality of images which have saturated regions.

22. (Previously Presented) The personal identification apparatus according to claim 20, further comprising:

a guide part for receiving the finger for causing the finger to arc along a length of the finger.

23. (Previously Presented) The personal identification apparatus according to claim 20, further comprising:

a measuring unit for measuring finger thickness,
wherein the processing unit controls an amount of the light from the light sources based on a result of the measuring.

24. (Previously Presented) The personal identification apparatus according to claim 20, further comprising:

a switch located at a position corresponding to placement of a tip of the finger,
wherein the processing unit initiates the personal identification when the switch is pressed by the finger tip.

25. (Previously Presented) A personal identification apparatus comprising:

a light source part to irradiate a finger with light from first and second sides of the finger;

an image capture unit to capture images by the light transmitted through the finger; and
a processing unit to cause the light to alternately irradiate the first side and the second side, and to cause the image capture unit to capture a plurality of images generated using the light from the light source part that irradiates the first and second sides of the finger at a timing of the irradiation of the light source part,

wherein the image capture unit and the light source part are not opposite each other in a coaxial form, and

the processing unit extracts a feature of a vein pattern of the finger using the images captured due to the light irradiated from the first side and the second side for personal identification.

26. (Previously Presented) The personal identification apparatus according to claim 25, wherein:

the captured images have a saturated region due to the light irradiated from the first side and the second side, and the processing unit extracts the feature of the vein pattern from a region of the images captured which is not saturated.

27. (Cancelled)

28. (Previously Presented) The personal identification apparatus according to claim 25, further comprising:

a guide part for receiving the finger for causing the finger to arc along a length of the finger.

29. (Previously Presented) The personal identification apparatus according to claim 25, further comprising:

a measuring unit for measuring finger thickness,
wherein the processing unit controls an amount of the light from the light source part based on a result of the measuring.

30. (Previously Presented) The personal identification apparatus according to claim 25, further comprising:

a switch located at a position corresponding to placement of a tip of the finger,
wherein the processing unit initiates the personal identification when the switch is pressed.

31. (Previously Presented) The personal identification apparatus according to claim 25, wherein:

the first and second sides of the finger correspond to right and left sides of the finger.

32. (Currently Amended) A personal identification method comprising:

irradiating light to a finger from two light sources disposed on two sides of the finger alternately;

capturing a plurality of images by the light from the light sources transmitted through the finger at a timing of the irradiation with an image capture unit;

extracting a feature of a vein pattern of the finger from the plurality of captured images generated using said light irradiated by said two light sources; and

executing personal identification using the feature of the vein pattern extracted from the plurality of images, wherein

each of the two light sources and the image capture unit are not opposite each other in a coaxial form.

33. (Previously Presented) The personal identification method according to claim 32, further including the step of:

extracting the feature of the vein pattern from unsaturated regions of the plurality of images which have saturated regions.

34. (Previously Presented) The personal identification method according to claim 32, further including the steps of:

measuring finger thickness; and

controlling an amount of the light from the light sources based on a result of the measuring.

35. (Previously Presented) The personal identification method according to claim 32, further including the step of:

initiating the personal identification when a switch located at a position corresponding to a tip of the finger is pressed.

36. (Previously Presented) The personal identification method according to claim 32, further including the step of:

placing the finger in a guide part causing the finger to arc along a length of the finger.

37. (Previously Presented) A personal identification method comprising:
irradiating a finger alternately from first and second sides of the finger with light;
capturing images by the light transmitted through the finger a plurality of times at a timing of the irradiation by a single image capture unit; and
extracting a feature of a vein pattern of the finger using the images captured by said single image capture unit due to the light irradiated from the first side and the second side.

38. (Previously Presented) The personal identification method according to claim 37, further comprising the step:
wherein the feature of the vein pattern is extracted from an unsaturated region of the images, having a saturated region, captured by the light irradiated from the first side and the second side.

39. (Previously Presented) The personal identification method according to claim 37, further comprising:
executing personal identification using the extracted feature of the vein pattern.

40. (Previously Presented) The personal identification method according to claim 37, further comprising:
measuring finger thickness; and
controlling an amount of the light for irradiation based on a result of the measuring.

41. (Previously Presented) The personal identification method according to claim 37, further including the step of:
initiating the identification when a switch located at a position corresponding to a tip of the finger is pressed.
42. (Previously Presented) The personal identification method according to claim 37, further including the step of:
placing the finger in a guide part causing the finger to arc along a length of the finger.
43. (Previously Presented) The personal identification method according to claim 37, wherein the step of irradiating the finger comprises irradiating right and left sides of the finger.
44. (Previously Presented) The personal identification apparatus according to claim 20, wherein:
the single image capture unit and each of the two light sources are not opposite each other in a coaxial form.
45. (Previously Presented) The personal identification apparatus according to claim 25, further comprising a single said image capture unit to capture images by the light transmitted through the finger.
46. (Previously Presented) The personal identification apparatus according to claim 21, wherein:
the light sources irradiate the light so as to cause the saturated region in the images captured by the single capture unit.

47. (Previously Presented) The personal identification method according to claim 32, further comprising a single said image capture unit to capture images by the light transmitted through the finger.